

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A liquid crystal display comprising:

a liquid crystal panel having a large number of picture elements arranged at intersections of plural selection lines and data lines;

a selection line signal output IC for outputting a selection line signal to the selection lines of said liquid crystal panel;

a reference voltage generator circuit, which comprises ~~plural~~ first resistors connected in series between two voltages and second resistors connected in series to said first resistors, generates plural reference voltages from respective connection points of the ~~plural~~ first resistors, switches over the reference voltage either to an image display voltage or to a black display voltage, and outputs the switched reference voltage to plural wiring lines connected to the connection points; and

a signal line drive IC, to which an image data signal and the reference voltage are inputted, and which outputs a voltage based on the reference voltage and the image data signal, to a data line of the liquid crystal panel,

wherein the reference voltage generator circuit has a switch section which is opened and closed by a black voltage selection signal, and

the switch section has first switching elements arranged in parallel to the first registers so as to open and close between a connection point for generating a black voltage and a connection point for generating a white voltage among the plural image display voltages, and second

switching elements which are arranged so as to control resistance values of the second resistors and which have polarities to those of the first switching elements, and outputs a black display voltage to the plural wiring lines by turning the first switching elements into closed states, and turning the second switching elements into opened states, on the basis of the black voltage selection signal to short-circuit between the connection points and to change resistance values of the second resistors, and

the signal line drive IC outputs a black write voltage to the data line on the basis of the black display voltage, and

the switch section includes an image display period for supplying said image display voltage and a black display period for supplying the black display voltage in one horizontal period, and is switched over by the black voltage selection signal, so as to be synchronized with a change of a selection line signal in a row of the selection line for writing an image therein and a row thereof for writing black therein.

~~switching said reference voltage is performed so that an image display period for supplying said image display voltage and a black display period for supplying the black display voltage are contained in one horizontal period, and the switching the reference voltage is synchronized with change in selection line signals of lines in which an image of said selection line is written and lines in which black is written regardless of data to be displayed.~~

2. (Previously Presented) The liquid crystal display according to claim 1, wherein when said selection line signal output IC drives nG selection lines and a selection line clock period TH is used for driving said selection lines, a signal, which makes the output of said selection line signal output IC valid when said reference voltage is switched to the image display voltage while making the output of said selection line signal output IC invalid when said reference voltage is

switched to the black display voltage, is inputted to said selection signal output IC during nGTH period from input of a start pulse, and an inverted signal of said signal is inputted after the nGTH period.

3. (Previously Presented) The liquid crystal display according to claim 1, wherein said reference voltage is switched from the black display voltage to the image display voltage at time T1 and switched from the image display voltage to the black display voltage at time T2, said selection line signal output IC outputs the selection line signals so that the lines of the selection lines selected at time $(T2-T1)/2+T1$ are changed to a non-selective state at a time later than $(T2-T1)/2+T1$ and earlier than T2.

4. (Previously Presented) The liquid crystal display according to claim 1, wherein said reference voltage is switched in a period during which no image data is loaded in said signal line drive IC.

5. (Original) The liquid crystal display according to claim 1, wherein said reference voltage is switched during a period when image data are loaded in said signal line drive IC.

6. (Withdrawn) A liquid crystal display comprising:

a liquid crystal panel having a large number of picture elements arranged at intersections of plural selection lines and data lines;

a selection line signal output IC for outputting a selection line signal to the selection lines of said liquid crystal panel;

a signal line drive IC for outputting an image write voltage and a black write voltage to the data line of said liquid crystal panel; and

a reference voltage generator circuit, which is arranged so as to generate reference voltage including an image display voltage used for outputting said image write voltage and a black display voltage used for outputting said black write voltage, switches to either a first reference voltage generation mode in which the black display voltage is generated under positive polarity and the image display voltage is generated under negative polarity or a second reference voltage generation mode in which the black display voltage is generated under negative polarity and the image display voltage is generated under positive polarity, and supplies the reference voltage generated in said changed reference voltage generation mode to said signal line drive IC, wherein:

said first reference voltage generation mode and said second reference voltage generation mode alternate every vertical period so that said image write voltage or said black write voltage is outputted to said picture elements during one vertical period.

7. (Withdrawn) The liquid crystal display according to claim 1, wherein said reference voltage generator circuit is comprised of resistors connected in series, and said resistance values are changed by switching elements connected in series or in parallel to said resistors.

8. (Withdrawn) The liquid crystal display according to claim 1, wherein said reference voltage generator circuit is comprised of a semiconductor device capable of inputting a digital signal, and a voltage of an arbitrary value is generated conforming to said digital signal.

9. (Withdrawn) The liquid crystal display according to claim 1, wherein said reference voltage generator circuit has an analog switch for switching the voltage from said image display voltage to said black display voltage or from said black display voltage to said image display voltage.

10. (Withdrawn) The liquid crystal display according to claim 1, wherein an absolute value of the black display voltage generated by said reference voltage generator circuit is lower than an absolute value of the black voltage of the image display voltage under the condition of normally black liquid crystal and is higher than said absolute value under the condition of normally white liquid crystal.

11. (New) A liquid crystal display comprising:

a liquid crystal panel having a large number of picture elements arranged at intersections of plural selection lines and data lines;

a selection line signal output IC for outputting a selection line signal to the selection lines of said liquid crystal panel;

a reference voltage generator circuit, which comprises first resistors connected in series between two voltages and second resistors connected in series to said first resistors, generates plural reference voltages from respective connection points of the first resistors, and outputs them to plural wiring lines connected to the connection points as image display voltages, and a signal line drive IC, to which an image data signal, a control signal and the reference voltage generated by the reference voltage generator circuit are inputted, and which outputs an image write voltage based on the image display voltage, to a data line of the liquid crystal panel,

wherein the reference voltage generator circuit has a switch section which is switched over, by a black voltage polarity selection signal, either to a first reference voltage generation mode in which the black display voltage is always generated under positive polarity and the image display voltage is generated under negative polarity or a second reference voltage generation mode in which the black display voltage is always generated under negative polarity and the image display voltage is generated under positive polarity, and

the switch section has first switching elements arranged in parallel to the first registers so as to short-circuit a connection point for generating a black voltage and a connection point for generating a white voltage among the plural image display voltages, and second switching elements which are arranged so as to control resistance values of the second resistors and which have polarities to those of the first switching elements, and outputs a black display voltage to the plural wiring lines by turning the first switching elements into closed states, and turning the second switching elements into opened states, on the basis of the black voltage selection signal to short-circuit between the connection points and to change resistance values of the second resistors, on the basis of the black selection signal, in the positive polarity and negative polarity respectively, and

the signal line drive IC outputs a black write voltage to the data line on the basis of the black display voltage, and the first reference voltage generation mode and the second reference voltage generation mode are alternatively switched over every vertical period by the black voltage polarity selection signal, so that said image write voltage or said black write voltage is outputted during one vertical period, about the picture element

12. (New) The liquid crystal display according to claim 11, wherein said reference voltage generator circuit is comprised of resistors connected in series, and said resistance values are changed by switching elements connected in series or in parallel to said resistors.

13. (New) The liquid crystal display according to claim 11, wherein said reference voltage generator circuit is comprised of a semiconductor device capable of inputting a digital signal, and a voltage of an arbitrary value is generated conforming to said digital signal.

14. (New) The liquid crystal display according to claim 1, wherein the switch section is formed by analog switches.